

# **Reflection on 20 Years of Architecture**

Software Engineering Institute  
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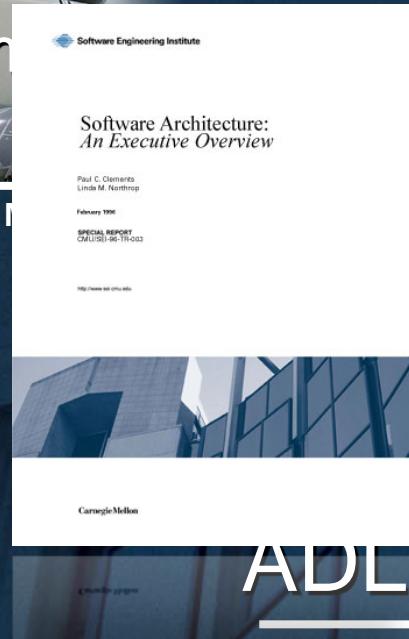
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# In 1992

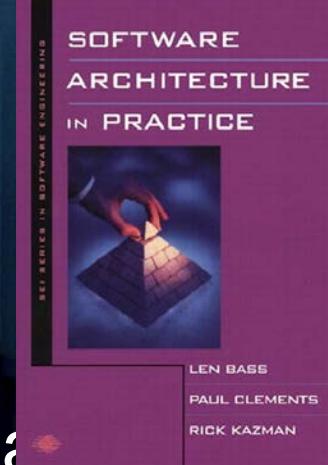
flight sim

STRUCTURAL I



usages  
ADLS definitions

SOFTWARE ARCHITECTURE



reliability  
security  
performance

ATTRIBUTES

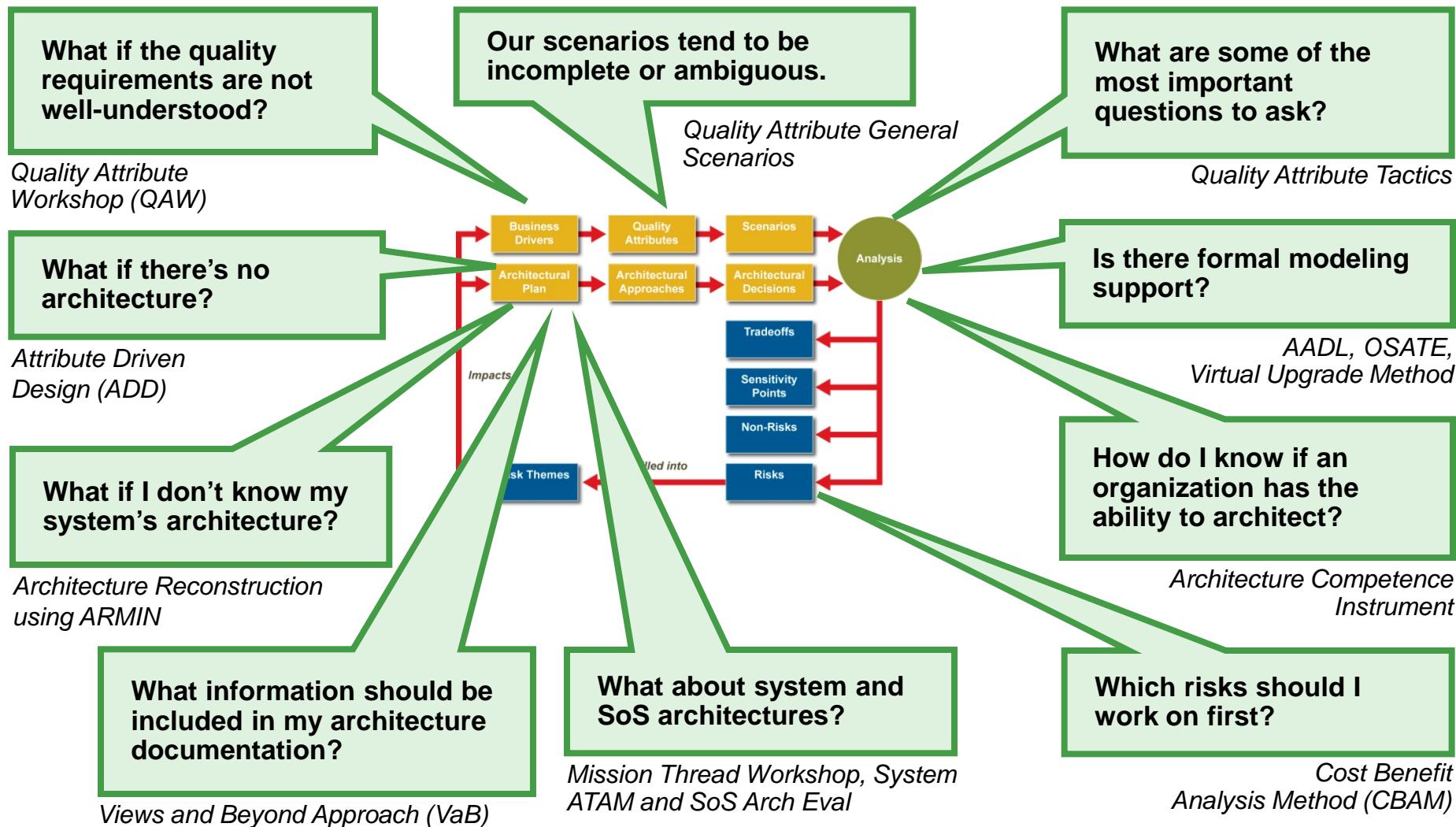


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# From Architecture Evaluation....



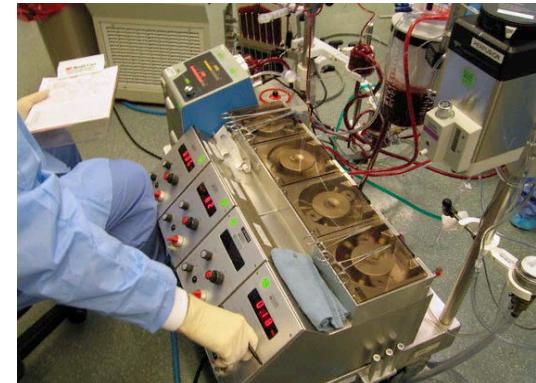
# .. to Architecture-Centric Engineering



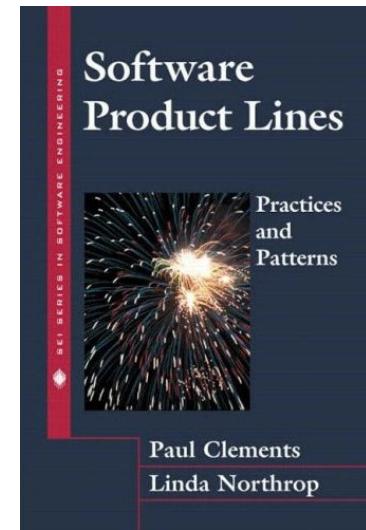
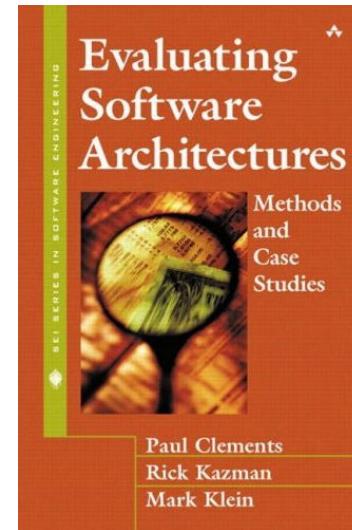
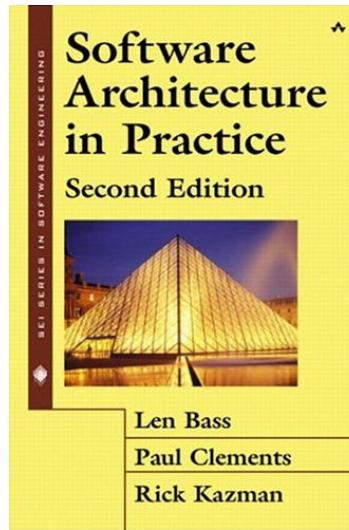
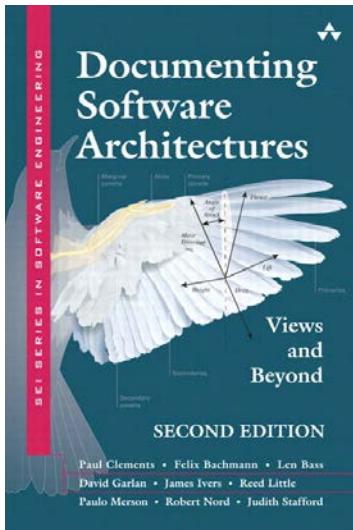
*Architecture is of enduring importance because it is the right abstraction for performing ongoing analyses throughout a system's lifetime.*

**Architecture-Centric Engineering (ACE)** is the discipline of using architecture as the focal point for performing ongoing analyses to gain increasing levels of confidence that systems will support their business and mission goals.

The SEI developed principles, methods, foundations, techniques, tools, and materials in support of creating, fostering, and stimulating widespread transition of the ACE discipline.



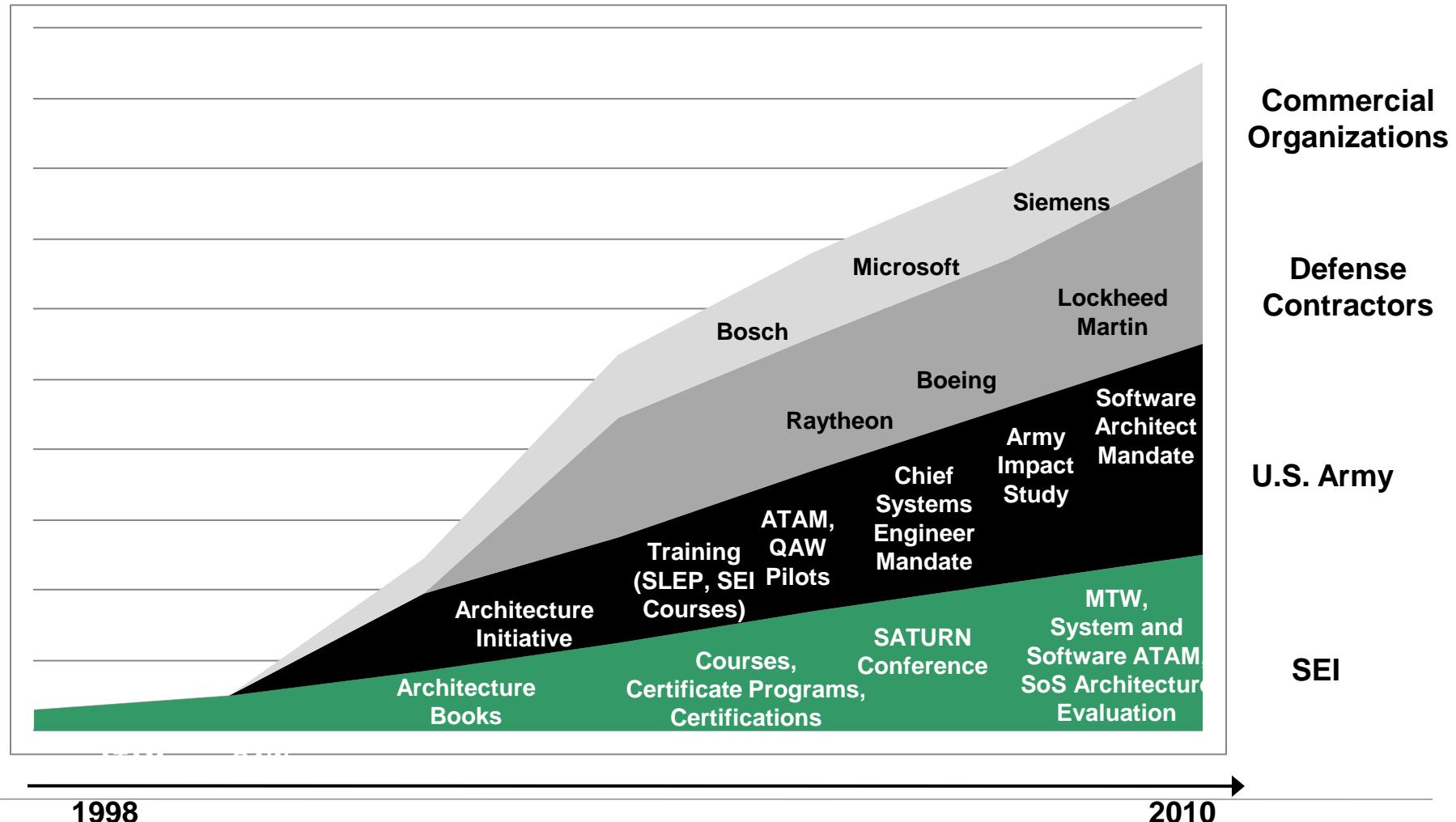
# Our View: ACE Requires One Must



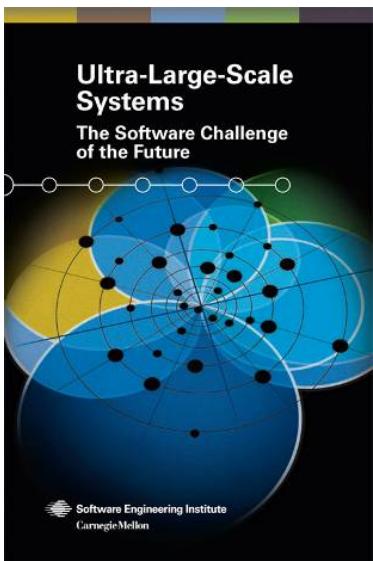
- *explicitly focus on quality attributes*
- *directly link to business and mission goals*
- *explicitly involve system stakeholders*
- *be grounded in state-of-the-art quality attribute models and reasoning frameworks*



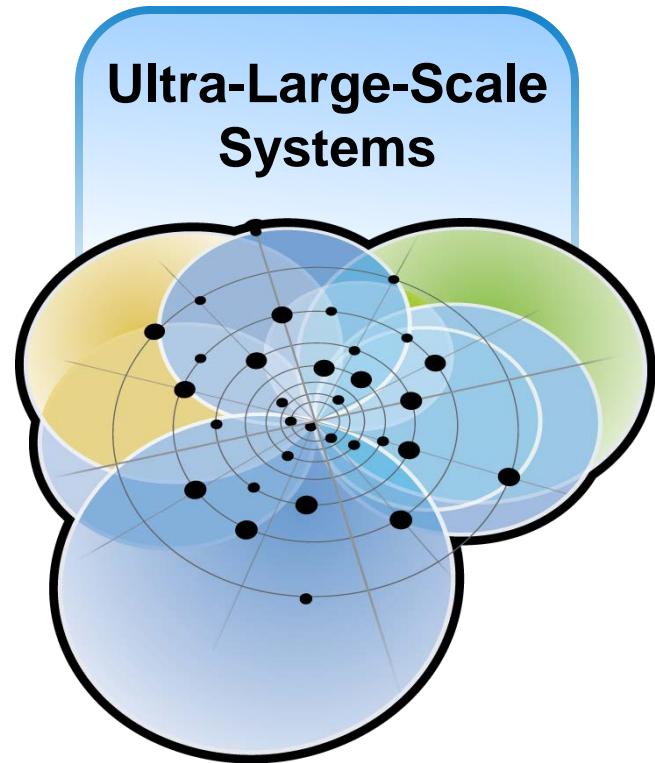
# Trends in Institutionalizing Architecture Practices



# Epiphany in 2006



- Decentralization
- Inherently conflicting, unknowable, and diverse requirements
- Continuous evolution and deployment
- Heterogeneous, inconsistent, and changing elements
- Erosion of the people/system boundary
- Normal failures
- New paradigms for acquisition and policy



# Today's Challenges

- Scale and complexity
- Increased operational tempo
- Decentralization and distribution
- Disruptive technologies



# Architecture Challenges

- What is the architecture of a socio-technical, cyber-physical system?
- What are the quality attributes that apply? And what are the underlying models?
- How can stakeholders be involved?
- .....



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